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10/613,075	07/07/2003	Patrick Vohlgemuth	116444	8538
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OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER NGUYEN, HANH N	
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10613075	7/7/03	VOHLGEMUTH ET AL.	116444

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Attached please find a copy of translation for JP-56049648 as requested by The Board Of Patent Appeals.

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Examiner, Art Unit 2834

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CY=JA DATE=19810506 KIND=A  
PN=56-049648

OPEN-TYPE MOTOR  
[Kaihogata denkokki]

Katsutoshi Kaneya

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C. June 2006

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APPLICANT	(71):	HITACHI LTD.
TITLE	(54):	OPEN-TYPE MOTOR
FOREIGN TITLE	[54A]:	KAIHOGATA DENKOKI

## Specifications

### 1. Title of the Invention

OPEN-TYPE MOTOR

### 2. Claim(s)

1. An open-type motor provided with a fan which rotates integrally with a rotor, sucks in outside air through vents provided in a motor case, guides it around the periphery of a stator core by means of a stationary fan guide in the case, cools it and discharges it to the outside through vents; said open-type motor characterized by brackets formed into an enclosed shape; and forming vents serving as air inlets and outlets in the housing and press-fitting and fixing the outer peripheral portions of fan guides to a position of the inner peripheral portion of the housing corresponding to nearly the axial center of these vents.

### Detailed Specifications

The present invention pertains to an open-type motor, and in particular, it relates to an open-type motor for planning a shortening of the axial length of the motor and a reduction in price.

An open-type motor has a configuration in which a fan, which rotates integrally with the rotor to suck in external air through vents provided in the motor case, guides air to the peripheral portion of the stator core by means of a stationary fan guide in the case, cools the stator core, and the air whose temperature has risen passes through the vents formed in the case and is discharged to the outside.

An example of a conventional structure of this type of motor will be described with reference to the half sectional view shown in Fig. 1.

This is a case of a gear-type decelerating motor comprised by coupling integrally a reduction gear composed of a combination of a plurality of gears and an open-type motor. In Fig. 1, 1 is a housing which forms the cylinder portion of the motor case; 2 and 3 are brackets which form the end faces of the motor case (2 is called an end bracket and 3 a middle bracket when they need to be differentiated); 4 is a stator winding; 5 and 6 are respective fan guides; 7 is a rivet; 8 is a rotor; 9 is a fan integrated with the rotor 8; 10, 11, 12 and 13 are respective vents, where 10 and 11 thereamong are vents serving as air inlets and 12 and 13 are vents serving as air outlets. The fan guides 5 and 6 are made of steel plates, while the fan guide 5 thereof is press-fitted and fixed to the inner circumferential portion of the housing 1 and the fan guide 6 is attached to the bracket 3 by the rivet 7. Moreover, 14 is a reduction gear and 15 is a deceleration output shaft.

In the above configuration, the fan 9 rotates integrally with the rotor 8 to accompany the rotation of this rotor 8 to move the air near the fan 9 radially by a centrifugal force and discharge it to the outside via the vents 12 and 13. Then the air passes through the vents 10 and 11 near the fan 9, and further, the outside air is taken in via the fan guides 5 and 6, and a so-called fan action is performed. The air thereof passes between the stator winding 4 and the peripheral portion of the stator winding; hence, the stator winding 4 and the stator winding are cooled and a rise in temperature is suppressed.

However, with the conventional configuration, as mentioned above,

the structures of the end bracket 2 and the center bracket 3 comprise the attachment structure of the fan guides 5 and 6, as in Fig. 1, and the vents 10 and 11 serving as the respective air inlets should be provided in the end bracket 2 and the center bracket 3. The axial length of the center bracket 3 is approximately 15 mm longer than the length of the brackets of a full closed-type motor. That is, there were inconveniences because the brackets of an open-type motor cannot be commonly used as the brackets of a full closed-type motor, and moreover, the axial length thereof was longer than that of the full closed-type motor.

An object of the present invention is to provide an open-type motor capable of shortening the axial length and also reducing the price, with the above-mentioned inconveniences in the prior art being eliminated and the bracket able to be used in common by an open-type motor and a full closed-type motor.

In order to achieve the above-mentioned object, the features of the present invention are composed of brackets formed into an enclosed shape; and forming vents serving as air inlets and outlets in the housing and press-fitting and fixing the outer peripheral portion of fan guides to a position of the inner peripheral portion of the housing corresponding to nearly the axial center of these vents.

The present invention will now be described with reference to the drawings.

Figure 2 depicts a half sectional view for describing a practical example of the present invention. In Fig. 2, 2a and 3a are respective brackets that differ from the case of the prior art in Fig. 1. These brackets

2a and 3a are fabricated in an enclosed shape and are not provided with vents serving as air inlets. Thus, the brackets 2a and 3a can be used jointly as the brackets used in a full closed-type motor, which enables a reduction in the product price. 10a and 11a are vents serving as air inlets and 12a and 13a are vents serving as air outlets. These vents are all formed in the housing 1. 5a and 6a are respective fan guides.

The outer peripheral portion of the 5a thereamong is press-fitted and fixed to a position of the inner peripheral portion of the housing 1 corresponding to nearly the axial center of the vents 10a and 12a, and the outer peripheral portion of the fan guide 6a is press-fitted and fixed to a position of the inner peripheral portion of the housing 1 corresponding to nearly the axial centers of the vents 11a and 13a. By arranging such vents and fan guides, air flows in through the vent 10a and flows out through the vent 12a, or it flows in through the vent 11a and flows out through the vent 13a. The parts of Figure 2 other than those mentioned above are the same as those of the conventional structure in Fig. 1.

Figure 3 is a half sectional view depicting another practical example of the present invention. The commercial value of the outside face of the case is higher than that of the practical example in Fig. 2 by changing the system for forming the vents 10a, 11a, 12a and 13a, but the functions are wholly the same.

According to the present invention, advantages are presented by forming the brackets as a fully closed type because they can be used jointly as the brackets for a full closed-type motor, and also, the axial length



of the motor can be shortened. Thus, miniaturization and a reduction in the price of a product is enabled. Since the attachment of the brackets to the housing is a press-fitting and fixing type, after assembly, there are no accidents at the ends of the rivet. Moreover, rivet hole cutting and the rivet itself become unnecessary, the price can be reduced, and so forth.

#### Brief Description of the Drawings

Figure 1 is a half sectional view of a conventional open-type motor; Figure 2 is a half sectional view of a practical example of the present invention; and Figure 3 is a half sectional view of another practical example of the present invention.

1: housing; 2a, 3a: brackets; 4: stator winding; 5a, 6a; fan guides; 7: rivet; 8: rotor; 9: fan; 10, 11a: vents serving as air inlets; 12a, 13a: vents serving as air outlets

Figure 1

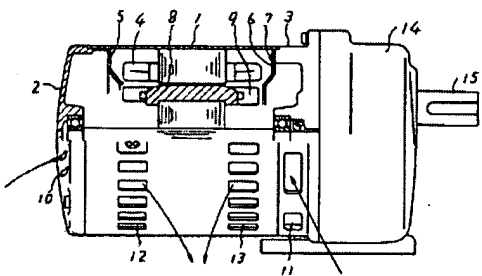


Figure 2

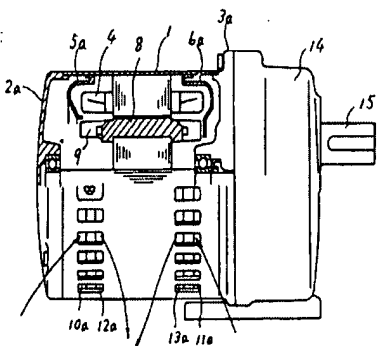


Figure 3

